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FISH & RICHARDSON PC
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MICHAEL ROBERTS, THOMAS CRAIG MASTERMAN, EDWARD H. PARK, SCOTT BATSON, PHILIP SWEENEY, MINGCHIH M. TSENG, and STEPHEN C. WITKUS

Appeal 2009-006012
Application 10/692,916
Technology Center 3700

Decided: February 25, 2010

Before: JENNIFER D. BAHR, STEFAN STAICOVICI, and FRED A. SILVERBERG, *Administrative Patent Judges*.

BAHR, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Michael Roberts et al. (Appellants) appeal under 35 U.S.C. § 134 (2002) from the Examiner's decision rejecting claims 55 and 57-60. Claims 1-54, 56, 61, and 62 have been canceled. We have jurisdiction over this appeal under 35 U.S.C. § 6 (2002).

The Invention

Appellants' claimed invention is directed to a gum-massaging oral brush. Spec. 1:30-34.

Claim 55, reproduced below, is illustrative of the claimed invention.

> 55. An oral brush comprising
>
> an elongated handle;
>
> a head portion, sized for insertion into the human mouth, extending from an end of said handle; and
>
> a brush portion comprising
>
> (a) one or more elastomeric element(s) extending from said head portion to a radiused terminal end to contact one or more teeth, said elastomeric element(s) comprising a thermoplastic elastomer having a Shore A hardness of 30 or greater, wherein the thermoplastic elastomer comprises an oil plasticized styrene-ethylene-butylene-styrene block copolymer and,
>
> (b) a plurality of bristles extending from said head portion comprising a non-elastomeric material,
>
> wherein said elastomeric element(s) extend(s) upwardly from said head portion in substantially the same direction as at least some of the non-elastomeric bristles.

The Rejections

The Examiner relies upon the following as evidence of unpatentability:

Muhler	US 3,613,143	Oct. 19, 1971
Dolinsky	US 4,288,883	Sep. 15, 1981
Endo (as translated[1])	JP 1-72128	May 15, 1989
Chen	US 5,334,646	Aug. 2, 1994

The Appellants seek review of the Examiner's rejections under 35 U.S.C. § 103(a) of claims 55, 57, and 58 as unpatentable over Endo[2], Dolinsky, and Chen, and of claims 59 and 60 as unpatentable over Endo, Dolinsky, Chen, and Muhler.

SUMMARY OF DECISION

We AFFIRM.

ISSUES

The Examiner rejected claim 55 with a proposed combination of the oral brushes in Endo and Dolinsky, with a particular styrene elastomer described in Chen. In particular, the Examiner found that Endo and Dolinsky describe the structure of the particular oral brush of claim 55, but merely describe the elastomeric element being a polystyrene-based thermoplastic elastomer, not an oil-plasticized styrene-ethylene-butylene-styrene (SEBS) block copolymer. Ans. 3. However, the Examiner found that Chen describes an oil-plasticized SEBS block copolymer. Ans. 4. The

[1] The accuracy of this translation is not disputed.
[2] The Examiner and Appellants refer to Endo as "ITO," "J-128," "JP-128," "'128," or "JP 1-72128."

Examiner concluded that it would have been obvious to use Chen's styrene copolymer as the styrene copolymer of the oral brush of Endo because one of ordinary skill in the art would select an appropriate material that would not damage a user's teeth or gums. Ans. 4, 6.

Appellants argue that Chen's SEBS block copolymer is too soft to have a Shore A hardness of 30, as required by claim 55. Appeal Br. 4. Appellants also argue that there is no teaching, suggestion, or motivation to combine the SEBS block copolymer of Chen with the oral brush of Endo. In particular, Appellants argue that just because Chen describes using the SEBS block copolymer as dental floss, Chen does not suggest its use in an oral brush. Appeal Br. 5. Further, Appellants argue that one of ordinary skill in the art would not consider Chen's soft material to have suitable mechanical properties for use in an elastomeric element of an oral brush. *Id.*

Appellants argue claims 55, 57, and 58 as a group. Thus, claims 57 and 58 stand or fall with claim 55. 37 C.F.R. § 41.37(c)(1)(vii) (2009). Appellants separately argue claims 59 and 60, merely noting that the deficiencies of the Examiner's rejection of claim 55, from which these claims depend, are not resolved by the further inclusion of the teachings of Muhler. Appeal Br. 6.

Therefore, the dispositive issue in this appeal is whether the Examiner erred by concluding that Endo, Dolinsky, and Chen render obvious, in combination, the selection of a SEBS block copolymer having a Shore A hardness of 30 or greater for the elastomeric element of Endo.

FACTS PERTINENT TO THE ISSUES

(FINDINGS-OF-FACT (FF))

FF1 Endo describes an oral brush having an elastomeric element made of a polystyrene-based thermoplastic elastomer, such as styrene-butadiene-styrene (SBS) or styrene-isoprene-styrene (SIS). P. 4; Appeal Br. 3. Endo describes that these elastomeric elements are to be resilient and flexible such as to be "soft, non-injurious to the gums and highly durable." P. 5.

FF2 Chen describes a method for taking a styrene-ethylene-butylene-styrene (SEBS) block copolymer and softening it by adding an oil plasticizer. *See* col. 2, ll. 21-29. The addition of the oil plasticizer results in a non-toxic plastic that is soft and flexible, and has a high dimensional stability, ability for repeated handling, and increased tear resistance and tensile strength. Col. 1, l. 59 to col. 2, l. 6.

FF3 Various SEBS materials are known to have a Shore A hardness above 30. For example, KRATON™ G1650, one of the SEBS materials used in Chen, is known to have a Shore A hardness of 75. *See* James M. Margolis, *Elastomeric Materials and Processes*, Table 6.15, in Handbook of Materials for Product Design (Charles A. Harper ed., Third ed., 2001) (further noting KRATON™ compounds generally have a hardness in the range of Shore A 28 to 95); Chen, Table I, n.2.

PRINCIPLES OF LAW

Discovery of an optimum value of a result effective variable is ordinarily within the skill of the art. *See In re Boesch*, 617 F.2d 272, 276 (CCPA 1980) and *In re Aller*, 220 F.2d 454, 456 (CCPA 1955). Even where

an applicant's modification results in great improvement and utility over the prior art, it may still not be patentable if the modification was within the capabilities of one skilled in the art, unless the modification produces a new and unexpected result that differs in kind and not merely in degree from the results of the prior art. *In re Huang*, 100 F.3d 135, 139 (Fed. Cir. 1996).

Additionally, where the difference between the claimed invention and the prior art is some range or other variable within the claims, "the applicant must show that the particular range is *critical*, generally by showing that the claimed range achieves unexpected results relative to the prior art range." *In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990) (citations omitted). "The fact that appellant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious." *Ex parte Obiaya*, 227 USPQ 58, 60 (BPAI 1985).

ANALYSIS

Claim 55 recites an oral brush having an elastomeric element made of an oil-plasticized styrene-ethylene-butylene-styrene (SEBS) block copolymer. Endo describes an oral brush having an elastomeric element made of a polystyrene-based thermoplastic elastomer, such as styrene-butadiene-styrene (SBS) or styrene-isoprene-styrene (SIS). FF1. Chen describes a method for taking a SEBS block copolymer and softening it by adding an oil plasticizer. FF2. The addition of the oil plasticizer results in a non-toxic elastomer that is soft, flexible, and has a high dimensional stability, ability for repeated handling, and increased tear resistance and tensile strength. *Id.*

The Examiner's position is that given Endo's desire for soft polystyrene-based materials, it would have been obvious to one of ordinary skill in the art to take Chen's SEBS materials, softened by oil plasticizers, as an appropriately soft material for Endo's oral brush. *See* Ans. 4, 5-6. The Examiner notes that it is obvious to select a suitable material to utilize its known properties, and that Chen's SEBS materials are already known to be suitable for use in oral care. Ans. 4; *see In re Leshin*, 277 F.2d 197, 199 (CCPA 1960) (holding that it is obvious to select a known material based upon its known intended uses).

The hardness of non-oil-plasticized SEBS block copolymers are known to be above 30 Shore A hardness. FF3 (noting, e.g., that Kraton G1650 has a Shore A hardness of 75). Chen teaches adding oil plasticizers to soften a SEBS material. FF2. At some point, the addition of Chen's plasticizers takes the SEBS material from 75 Shore A to a value less than 30 Shore A. Therefore, one of ordinary skill in the art would have inferred from Chen that the addition of some amount of oil plasticizers will result in a softened SEBS material above 30 Shore A. *See In re Preda*, 401 F.2d 825, 826 (CCPA 1968) ("it is proper to take into account not only specific teachings of the references but also the inferences which one skilled in the art would reasonably be expected to draw therefrom."); *Boesch*, 617 F.2d at 276 (discovery of an optimum value of a result-effective variable is ordinarily within the skill of the art.); *Aller*, 220 F.2d at 456.

Appellants argue that Chen only describes oil-plasticizing that results in a SEBS material less than 30 Shore A, and thus cannot meet the limitation of claim 55 requiring a material greater than 30 Shore A. Appeal Br. 4. However, the relevant inquiry is whether Endo, Dolinsky, and Chen, in

combination, *render obvious* the claimed elastomeric element made of a SEBS material having a hardness of 30 Shore A or greater, not whether the references explicitly describe a material having a certain hardness. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) ("the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim"). Obviousness does not require that all of the features of the secondary reference be bodily incorporated into the primary reference. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981). Moreover, the artisan is not compelled to blindly follow the teaching of one prior art reference over the other without the exercise of independent judgment. *Lear Siegler, Inc. v. Aeroquip Corp.*, 733 F.2d 881, 889 (Fed. Cir. 1984).

As discussed above, it is the Examiner's position that Chen renders obvious an oil-plasticized SEBS material suitable for use in an oral brush. If adding large amounts of oil plasticizers, on the order of what is specifically described by Chen, creates a very soft material, one of ordinary skill in the art would readily appreciate that adding lesser amounts of oil plasticizers would likely create a less soft material. *See KSR*, 550 U.S. at 421 (a "person of ordinary skill is also a person of ordinary creativity, not an automaton."). Chen certainly supports such reasoning. *See* Chen, Table II (noting that a greater amount of oil plasticizer correspondingly reduces gel rigidity). Appellants do not provide any evidence or affidavits that would tend to refute the Examiner's position. *In re Dillon*, 919 F.2d 688, 692 (Fed. Cir. 1990) (if a prima facie case of obviousness is established, the burden shifts to the applicant to come forward with arguments and/or evidence to rebut the prima facie case.); *In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990) (where the difference between the claimed invention and the prior art is

some range or other variable within the claims, "the applicant must show that the particular range is *critical*, generally by showing that the claimed range achieves unexpected results relative to the prior art range.").

Appellants further argue that there is no teaching, suggestion, or motivation that would have led one of ordinary skill in the art to the Examiner's proposed combination. Appeal Br. 5. However, as correctly pointed out by the Examiner, Endo explicitly teaches the particular genus to which SEBS belongs, and Chen notes that SEBS is useful in a related oral care art. Ans. 4; Chen col. 7, ll. 18-41 (noting the material can be used for dental flossing).

In particular, Endo prefers polystyrene-based thermoplastic elastomers. *See* FF1. SEBS, described in Chen, is a polystyrene-based thermoplastic elastomer, and is therefore an example of Endo's preferred material. *See Elastomeric Materials and Processes* at 6.36 (noting that it is generally known in the art that styrenic thermoplastic elastomers are SBS, SEBS, and SIS); *KSR*, 550 U.S. at 421 (when "there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp"). Appellants have not provided any evidence that SEBS was unknown to those of ordinary skill in the relevant art, nor would it appear that such would be the case, given that SEBS was clearly known to be used in a closely related field of endeavor, dental floss, as evidenced by Chen.

Finally, as pointed out by the Examiner, using a non-toxic, and durable yet soft polystyrene-based material, as generally described by Chen, as the particular polystyrene-based material would be nothing more than utilizing a known suitable material for its known properties. *See* FF2 (noting

Chen describes a non-toxic plastic that is soft and has a high dimensional stability); FF1 (noting that Endo desires a plastic that is "soft, non-injurious to the gums and highly durable"); *Leshin*, 277 F.2d at 199. Therefore, a softened SEBS material appears to be exactly the kind of polystyrene-based material that Endo desires for its oral brush.

CONCLUSIONS

The Examiner did not err by concluding that Endo, Dolinsky, and Chen, in combination, render obvious the selection of a SEBS block copolymer having a Shore A hardness of 30 or greater for the elastomeric element of Endo. Therefore, we do not find error in the Examiner's rejection of claims 55, 57, and 58 as unpatentable over Endo, Dolinsky, and Chen. Likewise, we do not find error in the Examiner's rejection of claims 59 and 60 as unpatentable over Endo, Dolinsky, Chen, and Muhler.

DECISION

The Examiner's decision is affirmed as to claims 55 and 57-60.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv) (2007).

AFFIRMED

hh

FISH & RICHARDSON PC
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022